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PATENT SPECIFICATION

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541,748

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PROVISIONAL SPECIFICATION

Improvements in or relating to the Treatment of Webs or Fleeces produced on Carding Engines

I, ANDOR VARGA, of 21, Park Grove, Frizinghall, Bradford, in the County of York, a Citizen of Hungary, do hereby declare the nature of this invention to be as follows:—

This invention relates to the treatment of the textile fibre webs or fleeces produced on carding engines. Such webs or fleeces require to be treated to increase the spinning properties of the fibres and this invention is especially applicable to the treatment for removing foreign substances or bodies from the webs or fleeces by pressure rollers or cylinders.

It has been found that under certain dry conditions there is a tendency for the presence of static electricity about the fibre web or fleece, which has a detrimental effect on the carding operation, such as causing the thin web or fleece to adhere to metal, wood or other parts of the machines used. Furthermore, it has also been found that in some cases the oil with which the textile fibres are impregnated, has a tendency to become viscous or to a certain extent solidified, which does not allow the oil to permeate the fibres uniformly to a desired degree.

The object of the present invention is to overcome the above difficulties and to increase the spinning properties of the fibres generally.

According to the present invention there is provided a method of treating the fibre web or fleeces produced on a carding engine so as to increase their spinning properties, consisting in submitting the webs or fleeces to heat of a given temperature.

The invention may also include the method of treating fibre webs or fleeces produced on a carding engine, consisting in submitting the said webs or fleeces to moisture and/or moist heat. The moist heat may be in the form of steam, which may or may not be superheated, through which the web or fleece is passed.

According to a feature of this invention, there is provided the method of treating webs or fleeces produced on a carding engine, consisting in passing the webs or fleeces between a pair of rollers or cylinders which produce a rolling or compressing operation on the webs or fleeces, and transmitting heat to the web or fleece through the medium of the rollers or cylinders. Moreover, each web or fleece may be submitted to the steaming process prior to, and/or after, its passage between the pressure rollers or cylinders.

In an embodiment of this invention the fibre webs or fleeces passing from the carding engine are led to and between one or more pairs of rollers or cylinders which are heated to a desired temperature, for example, approximately the same temperature as that of the surrounding air. The rollers may be so arranged that only a light pressure is applied to the web or fleece that passes between them, or the pressure may be sufficient to crush any foreign bodies mixed in the fibres.

By submitting the web or fleece to heat treatment in the above manner, the oil impregnating the textile fibres is caused to more uniformly permeate such fibres, due to the fact that any tendency of the oil to become viscous or slightly solidified is counteracted by the heating operation. This heat treatment also tends to neutralise any static electricity which has a tendency to form under certain conditions due to the carding operation. Static electricity is particularly liable to form during very cold spells, and has a detrimental effect on the carding operation due to it causing the textile fibres to stick to metal, wood or other parts, and also its tendency to counteract the actual carding operation.

As the fibres are spread by the carding operation, a relatively large surface is presented by the web or fleece whereby the tendency for the drying out of the moisture in the fibres, the presence of which is necessary for efficient work, is increased. Furthermore, the crushing of impurities by rollers or cylinders necessitates the production of a still thinner web which in addition causes greater exposure to the air, whereby still more moisture is lost.

To replace the moisture and further facilitate the treatment of the fibre webs

[*Price* 1/-]

Price 4s 6d.

or fleeces, moisture in a vapourised or other form, or a moist heat may be introduced to the web or fleece at any desired point or points. For example, with heated or other pressure rollers, moisture or steam may be introduced before or after such rollers according to the nature of the textile fibres being treated. When fibres for woollen spinning are being treated, then the moisture or steam could be introduced prior to the rollers, but when fibres for worsted spinning are being treated it is preferred to apply the moisture or steam after the said fibres have been submitted to the heating and/or pressing operation. In some cases it may be preferred to apply a moisture or steam treatment both before and after the pressing and/or heating operation. The moisture or steam treatment may take place in a chamber, a partially enclosed area or the like, so that the moisture or steam cannot readily pass away to metal parts which may become rusted or be otherwise affected by the action of the moisture or steam.

In some cases it may be necessary, as for instance in worsted carding or when the web or fleece is excessively wet, to dry the web or fleece before passing between the pressing rollers, because dry impurities are crushed more efficiently than moist ones. Therefor in a particular construction for the treatment of textile fibres used in worsted or similar industries, the fibre web or fleece is led partially around one heated roller before being led between it and a further roller which may also be heated, and finally away around the second roller. If so desired, the web or fleece may be moisture or steam treated after its passage between the rollers to restore humidity.

The steam treatment may include a steam pipe, roller or other device over, or in close proximity to, which the web or fleece is led, with a suitable cover or other member to retain the steam. It will be seen that the action of the steam in moistening the fibres and the surrounding air will tend to counteract any static electricity apart from its beneficial effect on the web or fleece. Any static electricity will tend to pass through the moistened air to the steam pipe to follow it to earth.

It will readily be understood that if the temperature of the pressure rollers is increased well above the temperature of the surrounding air, then the physical properties of the fibres will be changed and, as the fibres are lying in one layer and coming into contact with a heated surface, each fibre will become ironed and consequently lustrous and thus allow new effects to be produced in yarn and cloth. Furthermore, such rollers may be engraved or embossed and so increase the variety of effects which could be produced from such textile fibres.

Dated this 8th day of April, 1940.
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75, Chancery Lane, London, W.C.2.

COMPLETE SPECIFICATION

Improvements in or relating to the Treatment of Webs or Fleeces produced on Carding Engines

I, ANDOR VARGA, of 6, Tivoli Place, Ilkley, in the County of York, formerly of 21, Park Grove, Frizinghall, Bradford, in the County of York, a Citizen of Hungary, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the treatment of the textile fibre webs or fleeces produced on carding engines in an effort to discharge static electricity from or about such webs or fleeces (all of which are hereinafter included in the term "webs") and to increase the spinning properties of the fibres. The invention is especially suitable for combination with a treatment for crushing foreign substances or bodies from the webs by pressure rollers or cylinders such as that disclosed in Patent No. 444,043.

It has been found that under certain dry atmospheric conditions there is a tendency for the presence of static electricity about the fibre web, which has a detrimental effect on the carding operation, such as causing the thin web to adhere to metal, wood or other parts of the machines used, and the individual fibres to repel each other and obstruct proper slubbing being formed.

Cotton webs produced on carding engines have had moisture in the form of a spray applied to the cotton fibres at a point where the web is concentrated to form a sliver. Such a process is solely for increasing the spinning properties and cannot discharge static electricity which is the primary object of this invention.

According to the present invention there is provided a method of treating the textile fibre webs produced on a carding engine, consisting in submitting a web to a moist vapour treatment so as to moisten the web fibres and the surrounding air, and ensuring that the density of said vapour renders the latter capable of forming a continuous conductive path between the web and a convenient earthing means for discharging static electricity from or about the web as well as increasing its spinning properties

This invention also includes the method of treating textile fibre webs produced on a carding engine, consisting in submitting a web to moist steam. The method further embraces a conmbination of heat and moist vapour.

According to a feature of this invention, there is provided in the aforesaid method of treating textile webs produced on a carding engine, the additional step consisting in passing a web between a pair of rollers or cylinders which produce a light rolling, or a crushing operation on the web. Heat may be transmitted to the web through the medium of one or both of the rollers or cylinders or by other means.

Referring now to the accompanying drawing in which two embodiments of the invention are shown by way of example only:—

Fig. 1 is a side elevation of apparatus for providing a heat and moisture treatment;

Fig. 2 is a side elevation on a reduced scale of the driving gears of the apparatus;

Fig. 3 is a diagrammatic side view of modified apparatus for treating webs or fleeces.

In the embodiment of this invention shown in Figs. 1 and 2 the fibre web 2 passing from one of the doffing cylinders of the carding engine is led to and between a pair (or pairs) of rollers or cylinders 3, 4, which are heated to a desired temperature. Preferably the surface speed of the rollers is the same as that of the doffing cylinder of the carding engine. Any convenient method of heating the rollers 3, 4, may be employed and that shown comprises flexible steam pipes 5 passing from the feed pipe 6 to the hollow stub axles 7 with exhaust pipes 8 passing from the opposite stub axles 9. The rollers are arranged in bearings 10 mounted in the supporting framework 11 and the pressure of the roller 3 is controlled through the springs 12 and hand device 13. Only a light pressure may be applied to the web that passes between the rollers, or the pressure may be sufficient to crush any foreign bodies mixed in the fibres. The said pressure may be applied mechanically as shown or the rollers 3, 4, may be set or adjusted and pressure applied by the heat causing expansion of the rollers.

By submitting the web to heat treatment in the above manner, the oil impregnating the textile fibres is caused to move uniformly permeate and/or surround such fibres, due to the fact that any tendency of the oil to become viscous or slightly solidified is counteracted by the heating operation. It will be seen that for this purpose the temperature requires to be regulated to a degree which suits working conditions, the web and the type of oil in use and causes the above permeation and distribution. The rollers 3, 4, are geared together by gear wheels 14, 15 and one is driven from any convenient motive source. The web passes away over a guide roller 16 which is driven from the lower axle 9 through gear wheels 17, 18 and 19. The two latter wheels are carried by a lever 20 pivoted at 21 to allow the adjustment of the guide roller 16 to and away from the roller 4. The rollers 4 and 16 also serve to support the web 2.

As the fibres are spread by the carding operation, a relatively large surface is presented by the web to the surrounding air whereby the tendency for the drying out of the moisture in the fibres, the presence of which is necessary for efficient work, is increased. Furthermore, when it is desired to cause a crushing of impurities in the web by rollers or cylinders, such as the rollers 3, 4 or those indicated at 22, 23, this necessitates the production of a still thinner web which in addition causes greater exposure to the air, whereby still more moisture is lost. Moreover the loss of moisture tends further to create static electricity which will already be present under certain atmospheric conditions. Also when crushing rollers are used, the great pressure and close contact of such rollers produces a further excess of static electricity. To discharge this electricity from the web and make it more or less non-electrical on its further passage, a vapourised moisture treatment is applied which also serves to replace the lost moisture and further facilitate the treatment of the fibre web. The vapourised moisture i.e., water treated to create moist vapour or moist steam is introduced to the web at any desired point or points preferably, but not necessarily, at a stage where the web is uniformly and thinly spread out. For example, with the above heated rollers, 3, 4, moist vapour or steam is introduced before and/or after such rollers according to the nature of the textile fibres being treated. A convenient arrangement is shown in Figs. 1 and 2 wherein the heated lower roller 4 is mounted in a water trough 24 so that steam is released adjacent to the web supporting roller 4 and will rise from the water surface to impregnate the web and create a conductive path. A shield 25 is used to concentrate, and may be to control, the steam before the rollers, 3, 4, and a cleaning device 26 is provided for the guide roller 16. The position of the device 26 may be adjusted for the guide roller 16 and the latter may be adjusted to control the amount of steam rising past it to the web.

When this invention is combined with a crushing operation then, and particularly in worsted or other carding where the web is excessively wet, it is preferred to facilitate the natural drying out of the web 2 before passing it between the crushing rollers because dry impurities are crushed more efficiently than moist ones. It is also preferred to apply moist vapour or steam after the said fibres have been submitted to the heat treatment and crushing operation.

As shown in Fig. 3, in a construction employing three crushing rollers 27 particularly suitable for the treatment of textile fibres used in worsted or similar industries, the fibre web is led partially around one heated roller 28 before being led between it and a further heated roller 29 from whence it passes to the crushing rollers 27. The number of heated rollers may be increased or diminished. The moist vapour or steam is released in a chamber 30 (a partially enclosed area or the like may be used) so that it cannot pass away readily to metal parts which may become rusted or be otherwise affected by the action of the moist vapour or steam. Steam is introduced to the chamber 30 through a perforated steam pipe 31, (although it may be introduced in some other manner) which is shown in Fig. 3 lying within an endless lattice 32 which supports the web so that the steam is released within the web supporting means. Water could be heated in the chamber so that steam would rise evenly to the web 2, or the heated rollers 3, 4, and trough 24 may be used. The steam treatment may include an unenclosed steam pipe, a perforated roller or an apertured steam chamber within the endless supporting lattice 32, in proximity to, or over, which the web 2 is led, with or without a suitable cover or other member to retain the steam.

The moist vapour or steam treatment for woollen or worsted carding discharges any static electricity which has a tendency to form under certain conditions due to the carding operation. Static electricity is particularly liable to form during dry spells, and has a detrimental effect on the carding operation due to it causing the textile fibres to stick to metal, wood or other parts, and also its tendency to counteract the actual carding operation. It will be seen that the moist vapour or steam will not only moisten the fibres and so have a beneficial effect on the web in the course of the further carding and spinning process, but will also moisten the surrounding air in a manner to render it capable of conducting static electricity. Therefore, it only requires the moist vapour or steam to be of a density sufficient to form a continuous conductive path between the web and a convenient earthing means for discharging static electricity. For example, any static electricity passes through the moistened air to the rollers 3, 4, and/or steam pipe and through to earth or by a special earthing arrangement associated with the said conductive path.

It will readily be understood that if the temperature of the pressure rollers is increased well above the temperature of the surrounding air, then the physical properties of the fibres will be changed and, as the fibres are lying in one layer and coming into contact with a heated surface, each fibre will become ironed and consequently lustrous and thus allow new effects to be produced in yarn and cloth. Furthermore, such rollers may be engraved or embossed and so increase the variety of effects which could be produced from such textile fibres.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A method of treating the textile fibre webs produced on a carding engine, consisting in submitting a web to a moist vapour treatment so as to moisten the web fibres and the surrounding air, and ensuring that the density of said vapour renders the latter capable of forming a continuous conductive path between the web and a convenient earthing means for discharging static electricity from or about the web as well as increasing its spinning properties.

2. The method of treating textile fibre webs produced on a carding engine according to claim 1, consisting in submittting a web to moist steam.

3. The method according to claim 1 or 2, wherein the vapour or steam is released within or adjacent to web supporting means.

4. In the method of treating textile webs produced on a carding engine accord-

ing to any of the preceding claims, the additional step consisting in passing a web between a pair of rollers or cylinders which produce a light rolling or crushing operation on the web.

5. The method according to claim 4, wherein the web is submitted to a heat treatment as well as a crushing operation.

6. The method according to claim 4, wherein the web is submitted to a moist vapour treatment after, and/or prior to, its passage between the rollers or cylinders.

7. Apparatus for treating textile fibre webs produced on a carding engine, comprising means for supplying heat to the web, or to rollers or cylinders for the web to pass between and means for supplying moisture to the web.

8. Apparatus according to claim 7, wherein a pair of rollers are mounted so that the web may pass between them and receive a heat treatment due to the rollers being heated to a given temperature.

9. Apparatus according to claim 8, wherein one of the heated rollers is immersed partially in water so that steam will be caused to rise to the web.

10. Apparatus according to claim 7, wherein the heat applying means and the moisture supply means are separate devices and applied at different points in the web's passage.

11. Apparatus according to claim 7, wherein the web is passed partially around two or more heated rollers before being submitted to a set of crushing rollers.

12. Apparatus according to any of the preceding claims 7 to 11, wherein means are furnished for adjusting the relative pressure between two or more rollers.

13. Apparatus according to any of the preceding claims 7 to 12, characterised by the rollers being heated by the introduction of steam to their interiors.

14. The method according to claim 4, wherein the rollers are caused to impart a crushing action on the web by heating the rollers to a temperature which causes expansion of the rollers.

15. The method according to claim 1 or 2, wherein the moist vapour or moist steam is applied when the web is uniformly and thinly spread out.

16. The method of treating textile webs substantially as described.

17. Apparatus for treating textile webs substantially as described with reference to, and as illustrated in, the accompanying drawing.

Dated this 7th day of March, 1941.

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75, Chancery Lane, London, W.C.2.

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[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

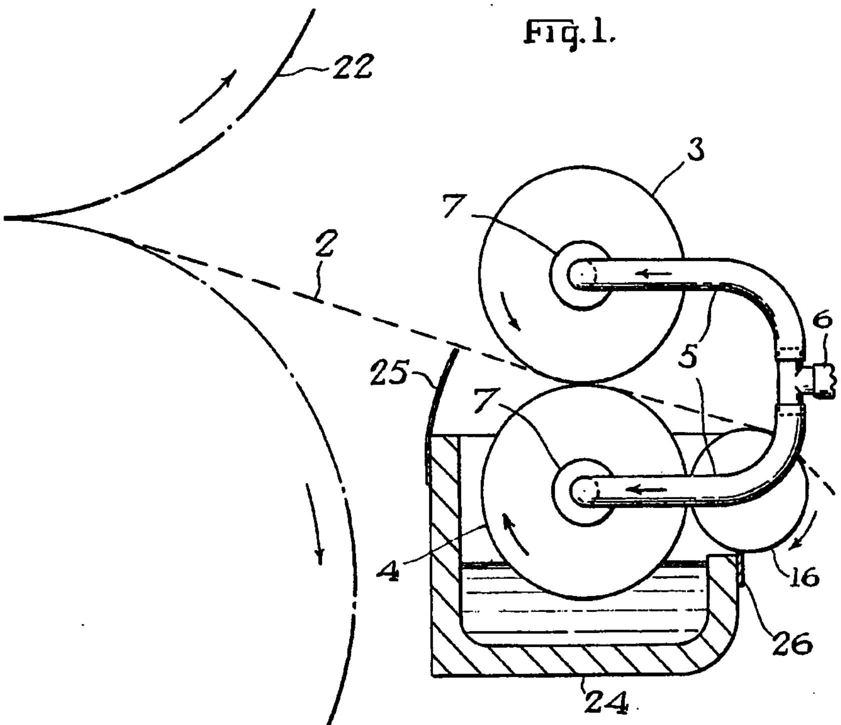


Fig. 2.

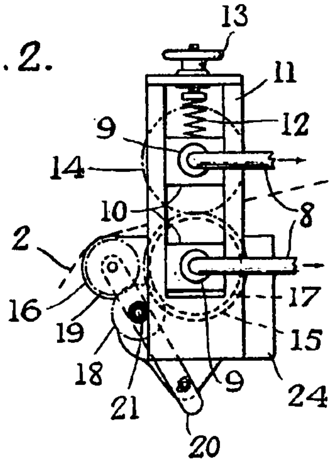
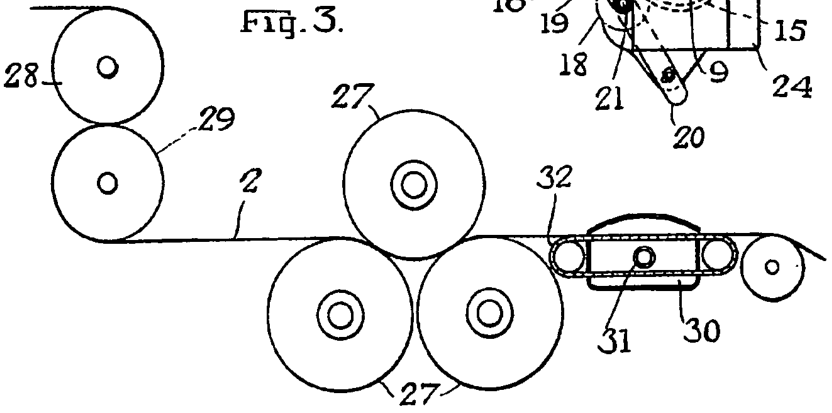


Fig. 3.



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